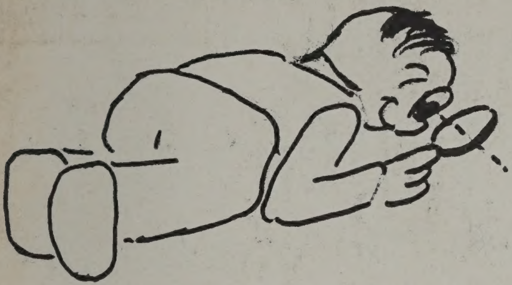
OUR 10th YEAR



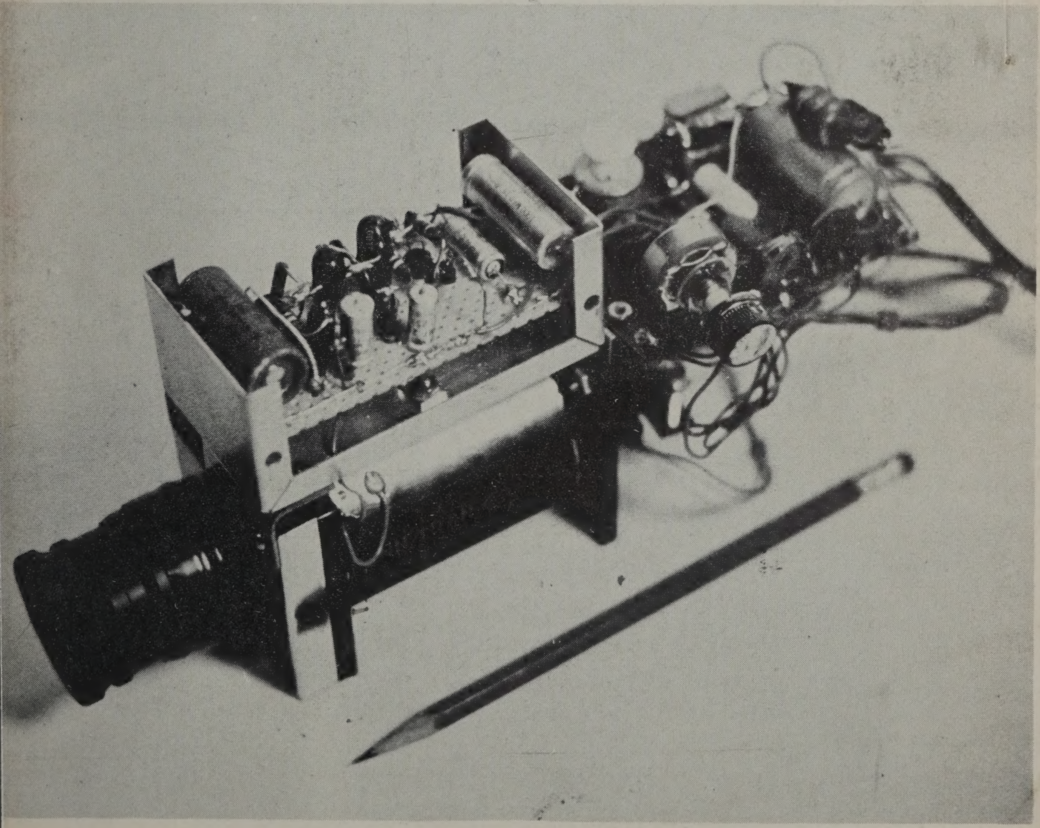
AMATEUR TELEVISION MAGAZINE

A5

January February 1977

build; ATV TRANSPONDER
70 CM TV TRANSMITTER
RTTY FSK GENERATOR
VIDEO CROSSHATCH AND DOT GENERATOR
and more inside this issue..................

below: A mini TV camera completed from the plans in the Sept. Oct. issue. (Build a four transistor camera)



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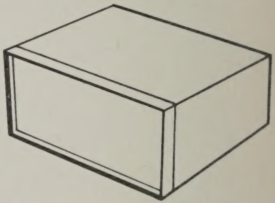
We're making a case for nice-looking equipment... VECTOR-PAK enclosures

There are no screws or fasteners to mar the lines of these beautiful enclosures. Has provisions for card guides, connectors, etc. on the inside. Available in black or computer blue with white front panel; shipped unassembled.



#VP5-17-17U 5.51"H, 17.58"W, 17.1"D **$79.25**

#VP7-17-17U 7.26"H, 17.58"W, 17.1"D **$84.00**

#VP9-17-17U 9.01"H, 17.58"W, 21.6"D or exact same size as IMSAI microcomputer. **$96.50**

CAVE grafix™

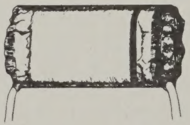
PREVIEW:

Pretty soon it's **going** to be time for the introduction of our new model 12 Volt, 8 Amp power supply. This one can handle 12 Amps on transmit and includes overvoltage protection. The big news is that it's super easy to build, since everything except the transformer and a couple other parts mount on the circuit board. We don't have the price nailed down yet, but when we do, watch this space for details.

UNINTERESTING SPECIAL

It may be hard to get excited about "old standby" parts like the **709 OP AMP**..even when they're factory fresh, prime parts. So in order to get you interested, we're selling them at **4/ $1.00!**

Running out of capacity?



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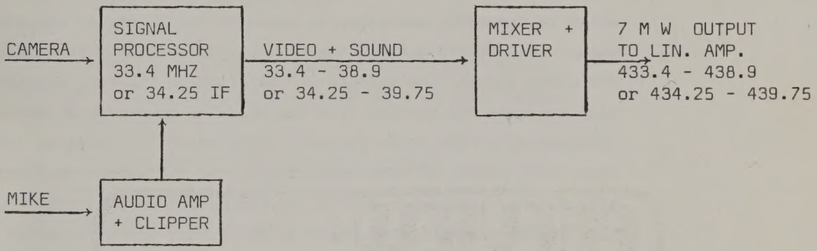
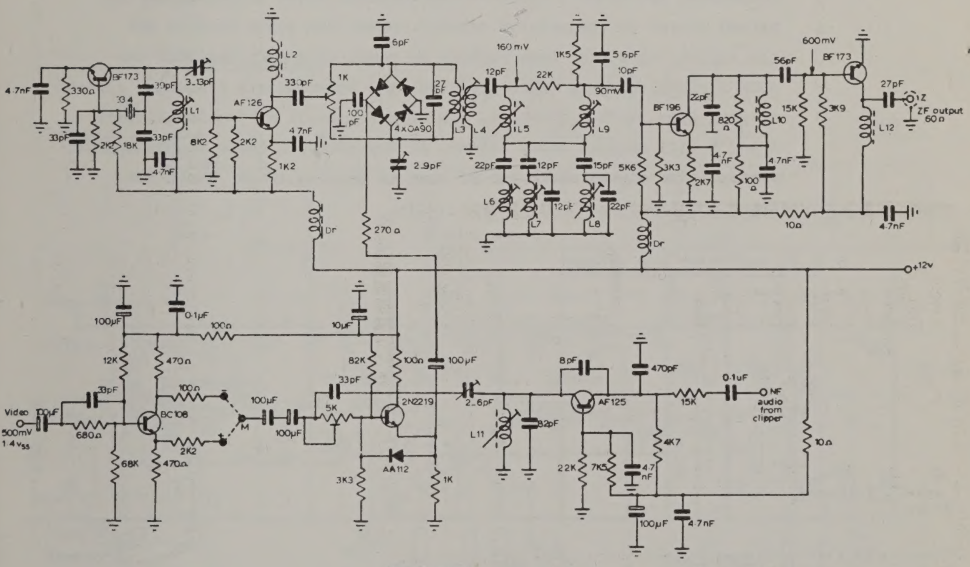
THE DK3JJ° A.T.V. TRANSMITTER FOR 70 CM.

1. Block diagram.



2. Signal processor.



Signal Processor

Driver board coil data

L1 15 turns 0.3mm copper wire 5mm former

L2 6 turns 0.5mm copper wire 5mm former

L3 3 1/2 turns 0.5mm copper wire 5mm former

Dr 1 : 5 turns

Dr 2 : 4 turns

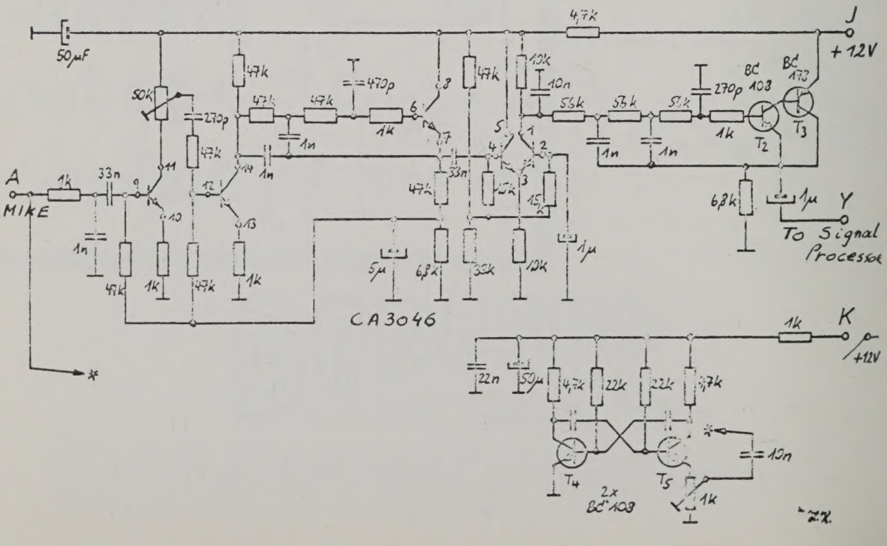
Dr 3 : 4 1/2 turns

4. Circuit description.

The video input signal is amplified in the clipper circuit and appears across the 5kohm gain control onthe IF board. Here it is led to the emitter of the AF125 transistor which consists of a 5.5MHz oscillator, which-is frequency modulated by means of the LF signal and led to the base of the 2N2219 through the trimmer. On this base there also appears the video signal. The mixture is now given to the ring modulator which also receives the carrier from the 34.25MHz quartz-oscillator. This is followed by a five tuned circuit filter which increasesthe upper side band. This signal is then amplified by the following transistor, BF 196, also by transistor BF 173. At the output of this unit, Z, there is a signal reaching from 34.25 to 39.75 MHz, which is passed by means of a coaxial cable to the driver board.

This unit consists of a 25MHz quartz-oscillator whose frequency is quadrupled to 400MHz (T1-T3). Those circuits above 400MHz appear as etched strips on the printed circuit board. The tuned circuit and the mixing transistor base receive by means of a 2pF capacitor the 400MHz signal, and by means of a tap, the intermediate frequency signal running from 34.25 - 39.75MHz. The output circuit of the transistors 4 and 5 will balance about 435MHz. At the output O there stands approximately a 7mW signal shich can be used to drive a linear amplifier later.

5. L.F. amplifier and clipper.

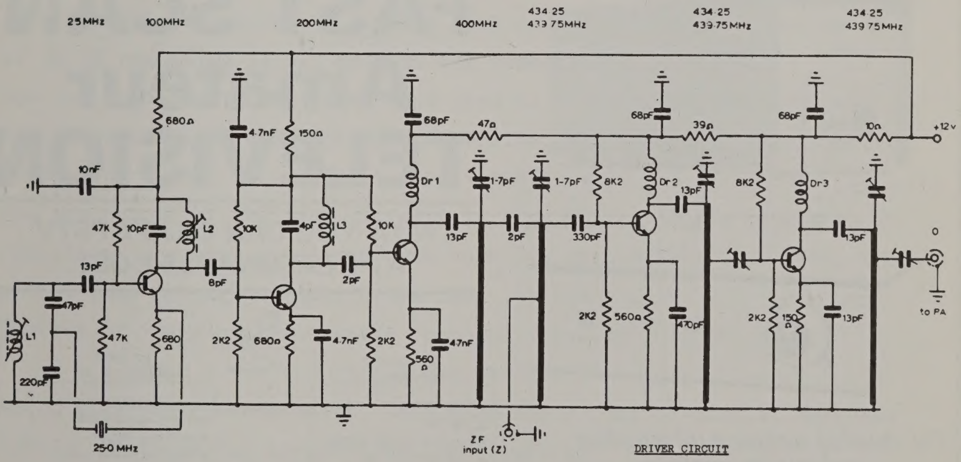


Signal processor coil dats.

L1	12 turns 0.4mm copper wire on 5mm former
L2	13 turns 0.3mm copper wire on 5mm former with ferroxcube core
L3	10 turns 0.5mm copper wire on 5mm former
L4	3 turns 0.2mm inside L3
L11	5.5MHz
L5-L6-L8	17 turns 0.3mm copper wire on 4mm former
L7-L9	12 turns 0.3 mm copper wire on 4mm former
L5	35MHz max
L6	31.9MHz min N.B. Dr is rf choke
L7	40.4MHz min
L8	33.4MHz min
L9	37.5MHz max
L10	6 turns 0.3mm copper wire on ferroxcube 5mm former
L12	12 turns 0.3mm copper wire on ferroxcube 5mm former

3. Mixer driver.

Tr BF-173 (5)



DRIVER CIRCUIT

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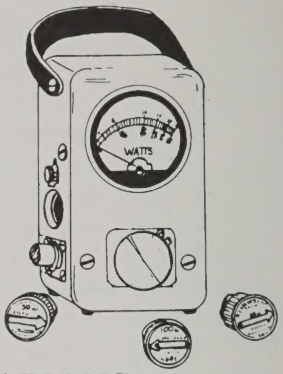

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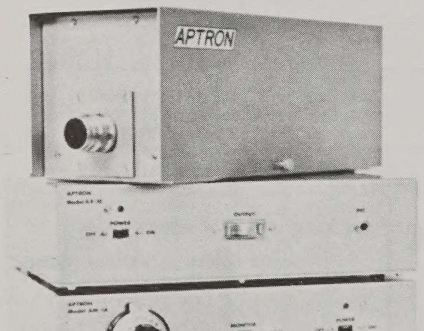

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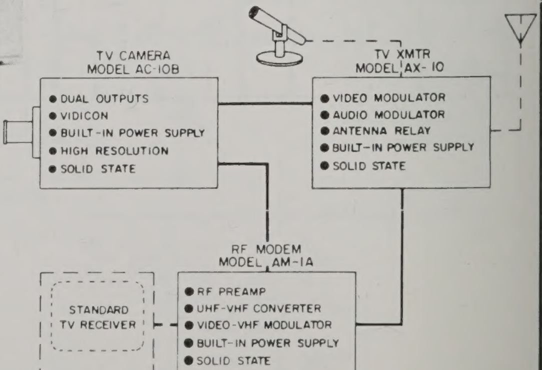

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A STANDARD AUDIO FREQUENCY SHIFT GENERATOR FOR RTTY.

After some rather negative experiences with an astable multivibrator, an urgent need was felt for a more stable and precise audio generator.

One of the main reasons was the the need for a reference when aligning rtty-tu's with high-Q discriminator coils. The shack audio generator did not provide the needed precision.

The idea was to use a crystaloscillator and a set of dividers, all in TTL logic. After some calculation 8032.5 kHz was chosen to be the most interesting frequency. 4016.25 kHz could be used, but the former was available in the "Junk-box". Two gates of an SN7400 N are used as an oscillator, while a third gate is used for pulse shaping.

This signal (8032.5 kHz) is fed into the divide-by-5 part of an SN7490N. This gives us 1606.5 kHz. the next part explains the principle of operation for 2125, 2550 and 2975 Hz. For 2295 only one thing differs as will be explained later.

The 1606.5 kHz signal is now fed into an SN7490 N, which, by feedback, divides the signal to 178.5 kHz (divide-by-9).

Normally (mark) the following SN7490 N's divide the signal by 42, also by resetting the two counters at this figure. (result : 4.25 kHz).

If a space is fed into the circuit, the count is changed either to 35 or to 30 resulting in 5.1 or 5.95 kHz respectivily.

Now for 2295 shift, the count of 9 used to divide the 1606.5, is changed to 10 (feedback eliminated) and the following dividers are set to count to 35. The result is : 16060.5 : 10 = 160.65 : 35 = 4.95 kHz.

Now the output of the last dividers is finally fad into a divide by 2, resulting in a nice symmetric wave form. To obtain less harmonics, the output goes through symmetric low-pass.

A drift of 1 kHz of the crystal frequency results in a drift of :

1000 : 5 : 9 : 35 : 2 = 0.317 Hz.

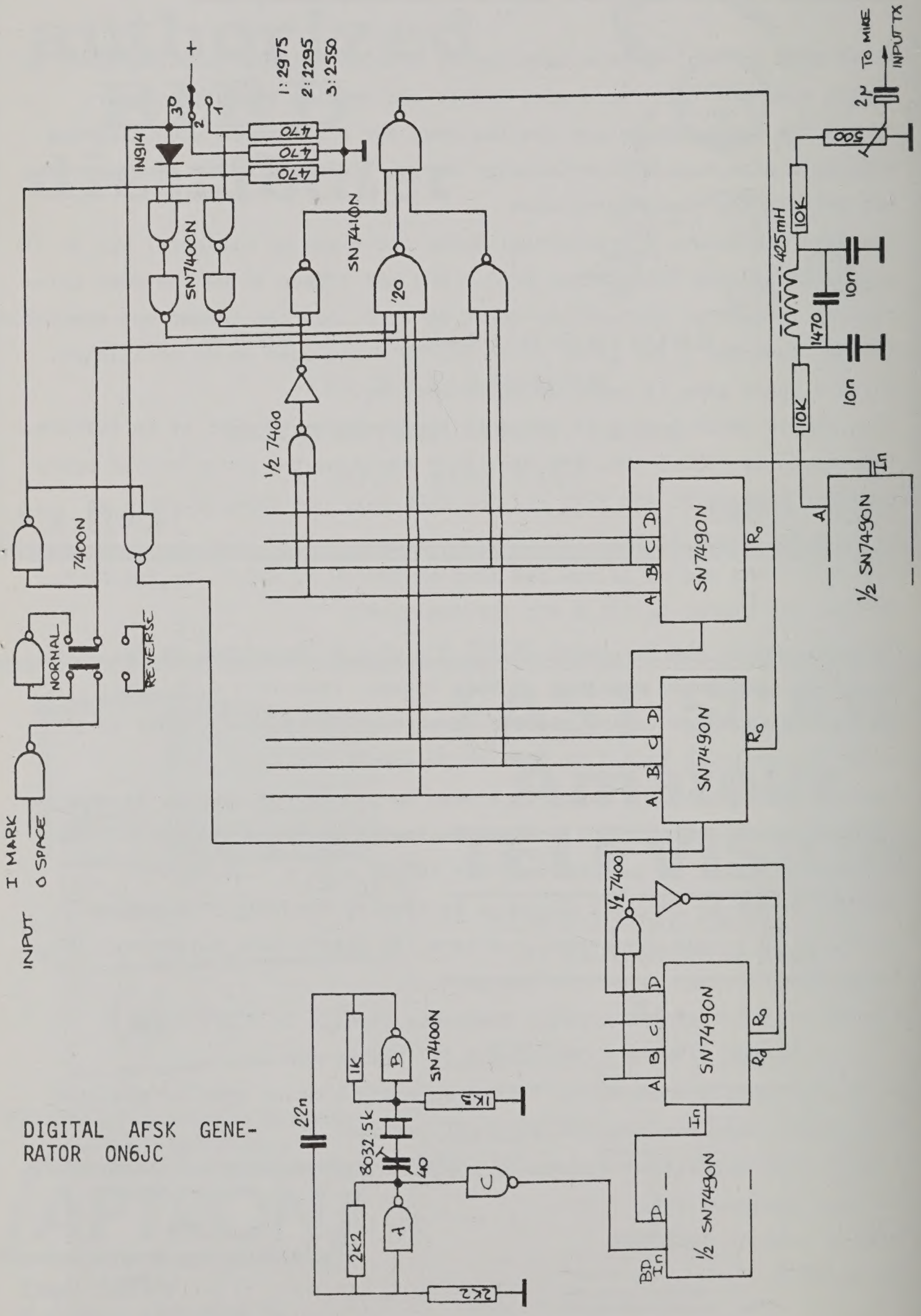
No TU will notice this shift. This also means that no special measures have to be taken for temperature stabilisation.

I built this circuit on a piece of montaprint of about 4 x 5 ". No PC has been designed yet.

Best of luck in building.

73 de ON6JC.

DIGITAL AFSK GENERATOR ON6JC



NEWS

Gary J. Kukla WB8WAF wrote in to pass along the following: "here is a tip you may want to pass on to your readers; I purchased an old but complete RCA CMU-15 transceiver at a hamfest which was tuned to 457 MHz. Before discarding the receiver, I pulled the crystals, checked the frequency, and found they multiplied out to 437 in the transmitter. I had no trouble with tune up and it has been on the air for over a year now."

Gary is also an engineer at WEWS TV in Cleveland and wanted to know if it was ok to make dubs of the A5 Ham Radio PSA. It sure is Gary. Neither A5 or any of its productions are copywrited so dub away.

Good PR

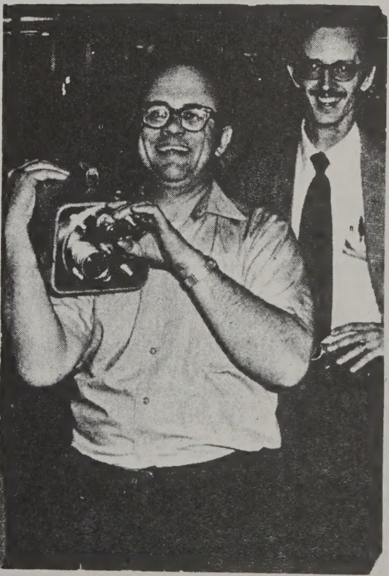
Shoppers in the Midway Mall located between Elyria and Lorain, Ohio found themselves on TV durings afety week recently. Ham TV that is. The northern Ohio ARS provided an extensive demo of ham radio services including ATV, RTTY, 2 mtr FM, and messages were handled to friends and relatives throughout the state.

The highlight of the display was a complete FSTV station belonging to W8.PSX. Visitors were able to view many area ham shacks via ATV. Thanks to World Radio News for this item.

The 320 mile ATV QSO reported earlier in this issue was between Hickory Hills, Ill, and Colombus, Ohio. WA8RMC, WA9ZIG/9 and W8DMR were on the Ohio end of the path. Bill, MDR runs 50 watts into a 48 element colinear. Ron at the Chicago end runs 500 watts into 4, 24 element yagis. Art, Dale and Bill believe this to be a FSTV DX record. Any challengers?

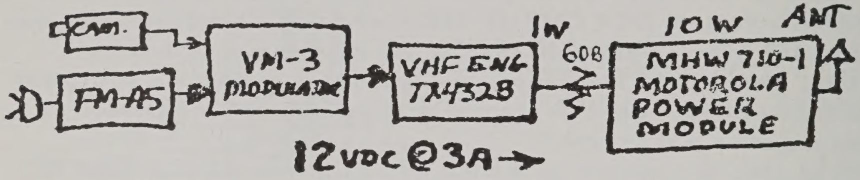
Ohio ATVers caught in the

act at Midway Mall.



James Mackner, W8PSX (holding camera), with Ronald Goltz, WB8TIW, assisting.

HANDS OFF ATV SOUND



WITH THE NEW IMPROVED FM-A5 4.5 MHZ ATV FM SOUND SUBCARRIER GEN YOU CAN BE AS MUCH AS 15 FEET AWAY FROM THE MICROPHONE PLAYING WITH THE CAMERA, ETC. AND HAVE PLENTY OF SOUND GOING OUT WITH YOUR PICTURE. THE NEW CIRCUIT HAS PLENTY OF ADJUSTABLE GAIN WITH ITS DUAL OP AMP AND LOW DISTORTION WITH THE SOFT LIMITER. ALL YOU NEED IS YOUR 12 vdc AND A 200 OHM DYNAMIC MIC SUCH AS USED AS REPLACEMENTS FOR TAPE RECORDERS. NO NEED TO CARRY AROUND BOTH THE CAMERA AND MIC ANYMORE!!!! HOOKS DIRECTLY INTO THE SOLID STATE VM-3 MODULATOR OR IN THE VIDEO LINE.
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ATV HELP

It seems that not a few times each month, a letter arrives which asks the questions we all have asked at one time or another, "How can I get started in ATV; how do I convert a TV to receive ATV; what should I use for a transmitter; what antenna should I buy?"

Not all of these questions could be answered in a single letter, and some would make good topics for a book. Even though a couple of ATV books are in the making, and while most of this information has appeared in A5 many times, it seems relevant to present the basic info again, modified to reflect current advances. Well, don't turn the page yet. The Sothern California ATV club has prepared a very good six page booklet which reveals the information in a consise format which should provide enough guidance to any beginner to get on the air with FSTV.

SO, all of you who really want to know how to do it, and get it going, send a #10 SASE to the SCATVC c/o Tom O'Hara W6ORG, 2522 S. Paxson, Arcadia, CA. 91006. Tom was the founder of the club many years ago and has remained active as well as one of the more literary prolific ATV'ers.

The ATV Guide covers how to convert a UHF tuner for ATV, build a low noise preamp, surplus transmitter conversions, AC supplies for surplus TX's, a video modulator, and how to assemble a complete solid state ATV transmitting and receiving system. Now where else could you find all that in six pages! Added no extra charge bonus, you old timer ATV'ers can relax for another issue before you protest our printing "reruns" again... 73 Henry WB9WWM

ANTENNA CONTEST

On the following page you will see some pix taken at the October 5th antenna measuring party held in Galion, Ohio. Eighteen ATV'ers brought ten antennas, all of which were carefully measured and provided 360° gain plots of each.

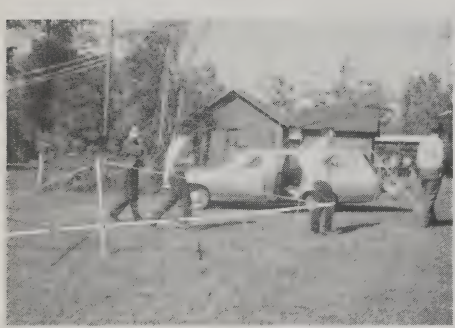
A horizontally stacked commercial array brought by WA8IUL measured 20.5 DB over the reference dipole, which incidentally, is exactly what the manufacturer claims! A pair of rhomboids designed by W8DMR and built by E. Allen and WB8LGA measured 21 and 18 DB gain respectivly.

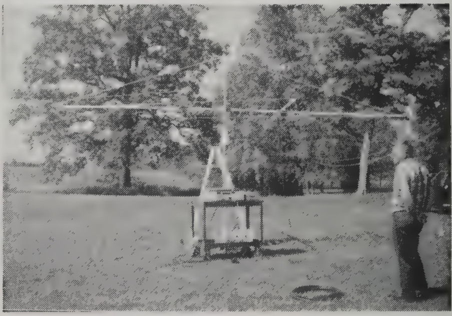
Measuring equipment used included a Singer 6201 generator, H/P 230 power amplifier, Boonton 91H RF voltmeter and a H/P 7035 chart recorder. The $20,000 in equipment was borrowed from North Electric Company by WB8LGA and K8ZES who sponsered the event.

W8DMR and WA8RMC were quite late in getting to the event from their home QTH in Colombus, Ohio. Seems a good band opening on 450 gave them a real treat. Two way video QSOs with good pix were extablished between Colombus, Ohio and Chicago's western suburbs a distance of 320 miles! This is beleived to be a FSTV DX record. Lowest power operated was 50 watts which still produced good pix.

Participants in the antenna measuring event were: WA8BAL, WB8BOK, W8DMR, WA8GYP, K8HVA, WA8IUL, WA8JLB, WA8KJJ, WB8KSQ, WB8LGA, WB8MNS, WB8PAT, WB8RBU, WA8RMC, WB8RNI, K8RXA, K8ZES and E. Allen.

GALION OHIO ANTENNA CONTEST PHOTOS





August 24, 1976

Editor, A-5
Hi OM:

For the last two years, I've been scrounging the A-5 mag from my brother-in-law, WB6MLY. I'm enclosing a subscription for my own copy. I will take this opportunity to let you know of the ATV activity in the San Francisco Bay area. There has been activity here for well over ten years. I was a late-comer into an organized group that spanned the whole bay area about eight years ago. At that time there were two stations experimenting with color. The group gradually dwindled until there were only two of us, K6TWF and myself remaining active. We kept the band alive and gradually a new and larger group has formed over the last two years. We have formed the Bay Area Amateur Television Society for the purpose of putting up a ATV repeater. We have a site at the local channel 36 antenna site (engineer is ATV'r), and a new member joining has a repeater license which he would like to use for ATV. Our club lists over thirty members and is growing. This is a list of active stations that can be found "on" most any eve... WB6EJT, K6HBR, WA6VAB, W6PTK, WB6RAW, WB6UQU, WA6ZXH, WB6WLE, WB6LRD, WA6YBD and WB6OAK. Our video carrier is 437.25 mhz with the aural at 441.75 mhz. The proposed repeater output will be at 425 mhz with the aural at 429.5 mhz. These frequencies were chosen to avoid 432 mhz, the dx freq and to keep out of the FM repeater band, since they are already overloaded in this area. Antenna polarization for simplex or repeater input is horizontal, repeater output will be vertical.

I have been running a T-44 with the MZL modulator and the K2RIW amplifier. A repackaged Link does for the audio. Also have a 3 watt version of the A-5 solid state transmitter. This with a 12 volt camera and 12 volt Sony receiver makes up our portable station. The rest of the group is diversified in types of equipment. A couple T-44's and GE (like T-44), Carfone, Homebrew 5894 rigs, and the VHF Engineering rigs are catching on now with two on the air and more ordered. The most popular antenna is the KLM 14 element (a pair). I use an 11 over 11 homebrew J-Slot. This and an RMS converter into a Sony receiver make up our station. We are holding nightly contacts with W6FEE in Chowchilla, a hundred miles over the mountain path with 20 watts. We initiated this contact some months ago, using 500 watts, but as Loren's station improved(preamp, antenna, antenna height and hardline coax), he was able to copy me with output reduced to 2½ watts. We are presently copying a VHF Eng 300 milli watt video transmitter (WB6EJT) 15 miles across the valley snow free pix.

Keep up the good mag and don't get led down the road of slow scan and FAC.

73's es BCNU
Bob Patterson WB6RAE

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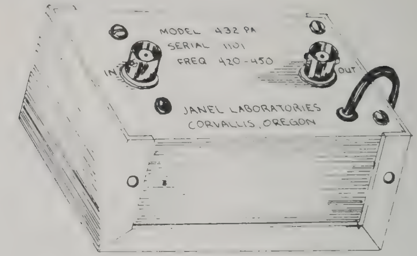

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SLOW SCAN

with

DAVE INGRAM K4TWJ

It seems that each year's SSTV innovations exceed all previous expectations and 1977 should prove no exception. The key to this year's expansions can best be described in two words: DIGITAL ELECTRONICS. The keynote to that subject is expandability. As you know, digital scan converters allow us to use conventional fast scan gear directly in the slow scan mode, but that is only a part of the concept.

During 1977, programmable microprocessors and expandable converters will be used for COLOR SSTV, limited MOTION SSTV, #-D SSTV, for video games, automatic station functions and much more. Yes, computer processed pictures are definately our next step in SSTV innovations.

Many SSTVers are working diligently on their ideas during these winter months and the results of their efforts will probably be the main topic of Dayton '77.

Dr. Robert Suding, W0LMD is presently working on a digital scan converter which uses 1/3 the parts required for conventional scan converters. This could result in a relatively inexpensive unit. However, Dr. Suding isn't stopping there. He's adding expandability so the unit can have multiple functions - and still cost slightly less than Robot's unit.

Dr. Don Miller, W9NTP, is presently working on a special two memory converter which can be used for color, 3-D, limited motion SSTV, frame averaging---and no telling what else. He's also researching a 16 KHz medium scan system which will be discussed presently.

Although not in the class of the previously described innovations, I am also working on a couple of winter projects which should pan out by spring. I'm setting up a rather unique type of two meter repeater and I'm preparing to bounce a TV signal off the moon. EME propagation suffers approximately 263 db attenuation, so this project should prove fairly challenging. These attempts will be conducted during February on 432 MHz, so if you would like to join in the action, drop me a note - soon! You'll need a good 432 MHz setup and a high gain antenna.

Medium Scan TV?

Here's an interesting question for you to ponder: How can you transmit a fast scan TV picture in a 35 KHz bandwidth? Challenging, isn't it? Dr. Don Miller, W9NTP, is presently working on this idea, and he may announce some results during mid-1977.

As you know, slow scan TV requires approximately 1000 Hz bandwidth to convey 1/8 of a frame each second. Motion TV would require eight fields per second. This would imply that everything would need to be sped up 64 times and that would require a 64 KHz bandwidth. That's too wide, but alternatives still exist.

Don is considering transmitting two partial fields four times per second. Thus one-half the pixels would be transmitted during the first field (64 lines by 64 pixels) and the other pixels (64 lines by 64 pixels) would be transmitted during the second field. This would produce a total of eight fields per second. Resulting bandwidth would be between 16 and 35 KHz (think vestigal). Special FCC permission could get this system rolling on the high end of 10 meters. Any station involved in this new quest would be required to build his own transmitting and receiving gear, but think of the possibilities involved with this system. For example; one field could convey cyan information and the other field could convey magenta. This would produce color TV! The fields could also be averaged for black and white reception. Don't start jumping to any conclusions on this system. It's only an idea (I better date that statement) Thoughts, however spur other innovations. Congratulations on another great idea, Don!

N6V

Now that N6V operations have calmed and the Jet Propulsion Lab's station has resumed the call W6VIO, many SSTVers are asking "what's next?" During 1977 JPL plans to cover Mariner's Jupiter/Saturn mission via SSTV! That should really ROCK 14,230!!!!

NEW SSTV BOOK

Copies of my new book "Slow Scan TV for Amateurs" should be available by the time you read this announcement. This book is jam-packed with up-to-date material and gigantic schematics which can easily be constructed on readilly available PC boards. I honestly think it will be a worthwhile investment for any avid SSTVer. If you have problems locating a copy of the book, write Peter Deksnis at TAB Books Inc., Blue Ridge Summit, PA 17214. He should have several more copies of the book than I.

SSTV CONTEST

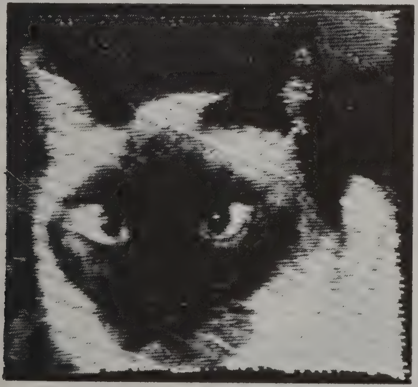
Don't forget the Worldwide SSTV contest which is scheduled for FEB 5-6. Rules should be basically the same as last year: exchange calls, RST, QSO number via video. Exact contest time hasn't been finalized as this announcement is being written, so I suggest that you check with the Sat. SSTV NET for final details. The NET meets at 1800 GMT on 14,230 KHz, sat.

DAYTON '77

If you plan to attend but havn't yet made plans, do it NOW. Dayton is also the biggest SSTV event Barring unforseen circumstances, the gang will again be staying at LaQuinta Motel, a supurb place with small meeting rooms which simply can't hold the large number of SSTV'ers gathered there after convention hours. Last year I couldn't get near the meeting room door until activities concluded. Maybe this year will be different. I hope to see all of you at Denny's (restaurant adjacent to Motel) during "slack hours"?? of convention!! 'Till then, 73. Dave Ingram K4TWJ, Eastwood Village # 604N Rt. 11 Box 499, Birmingham, AL 35210

LEFT SSTV picture of siamese cat belonging to Mel K0FVZ. Faint skewed lines tunning from left to right are due to tape recorder running slower on playback than during record.

RIGHT Actual "caught in the act" picture of W0LMD's little mean dog!



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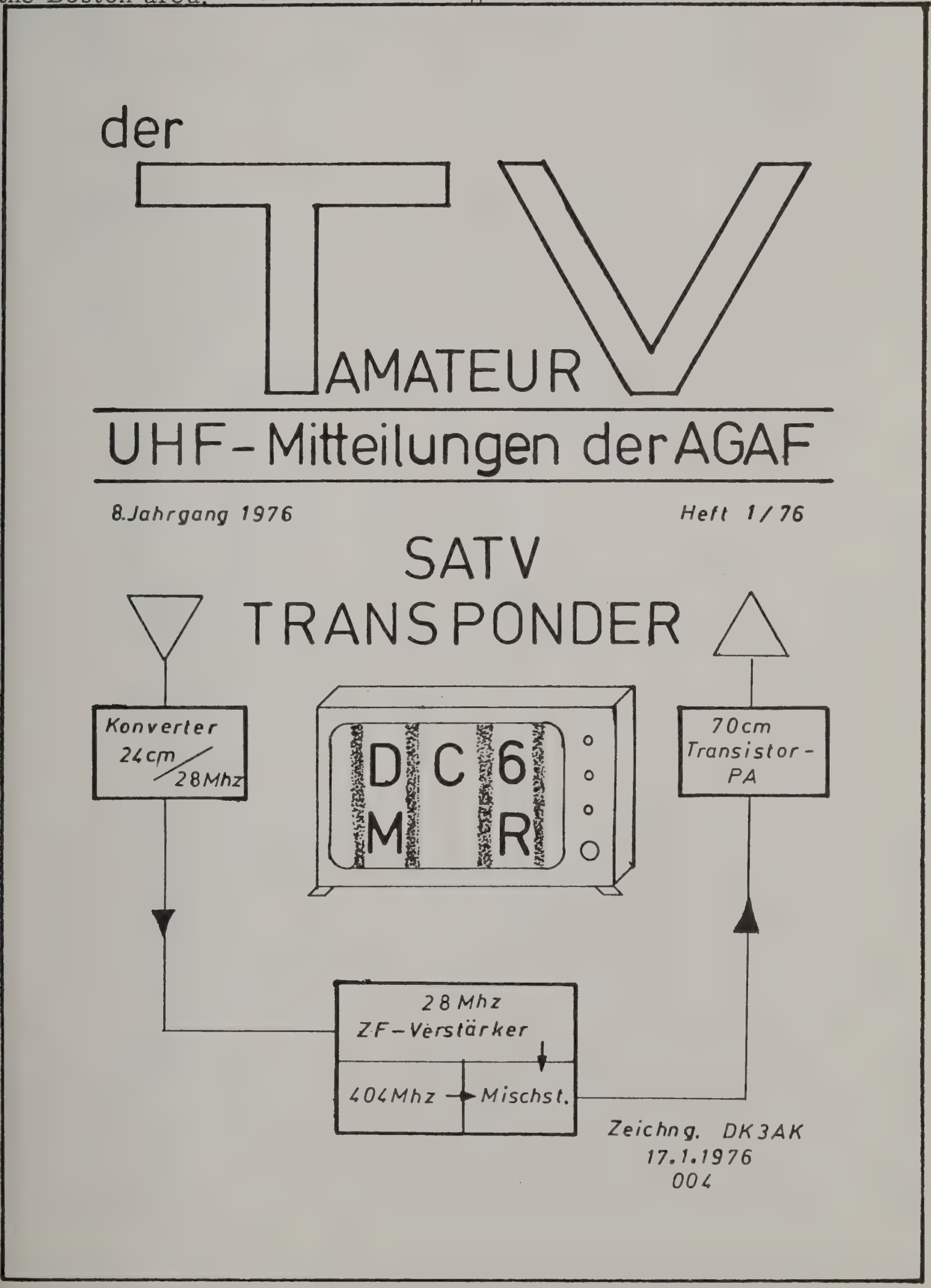
Last issue, we told you about SATV. This issue, we have the complete diagrams to build your own SATV transponder. The block diagram was directly from the front cover of the German ATV magazine, Der TV Amateur, which is also the source of the material. If you can read or comprehend German, you should subscribe as the technical articles in Der TV Amateur are superb. Their editor recently paid a visit to the Boston area. We trust he had a good time here.



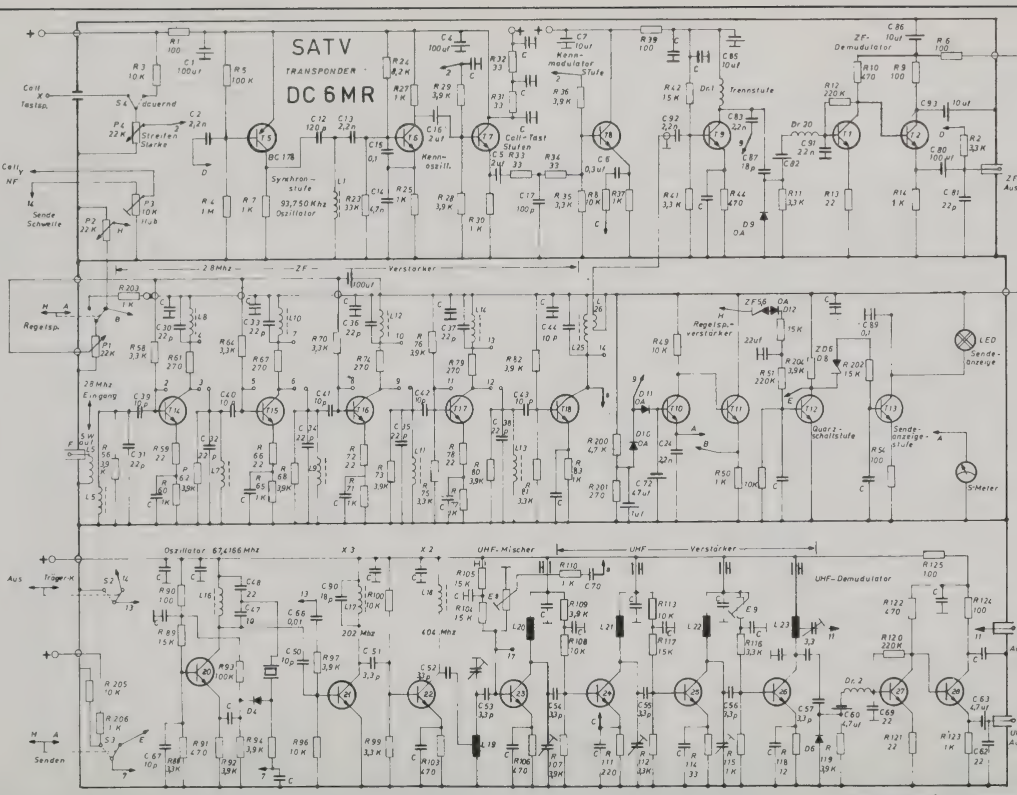
der TV AMATEUR

UHF-Mitteilungen der AGAF

8. Jahrgang 1976 Heft 1/76

SATV TRANSPONDER

Zeichng. DK3AK
17.1.1976
004



durchführungs „C" 1–4,7uf

trimmer 0,3–5p Valo grau
L5–16 + 25 18W 0,1 auf 5 ⌀ Körper
L1 800W 0,1
alle C' 2,2n EDPU
T1/2/27/28/13 = BC108
T6/7/8/9/10/11/12/14–26 = BF199

	Datum	Name
Gezeichnet	15.1.1976	Krause
Geprüft	17/1.1976	Verhaus
Normgepr.	22/1	

DK3AK
DC 6MR

Siegmar Krause
5982 Neuenrade
Wiesenweg 20
Tel 02392/61143

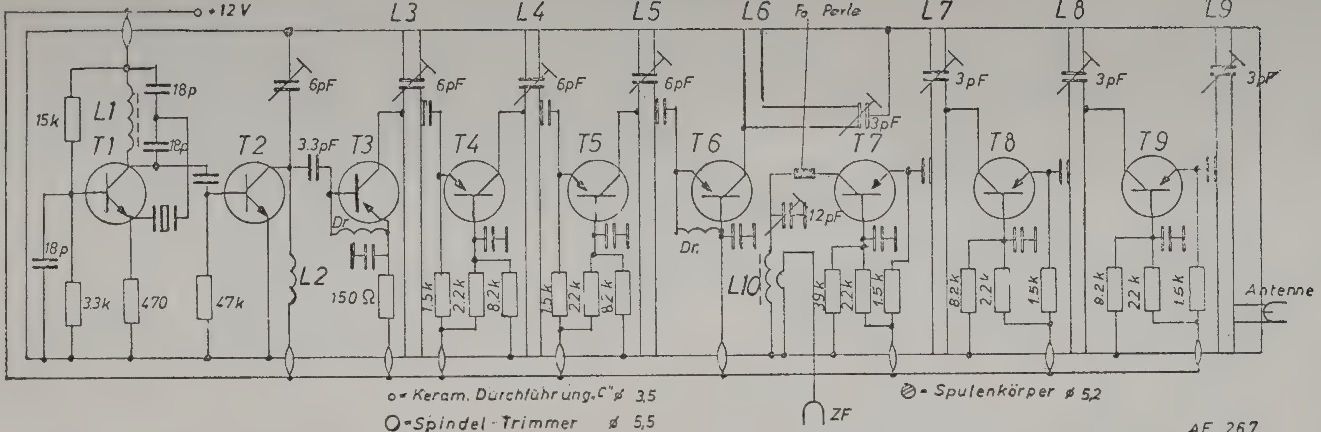
Maßstab

Aufbau auf geändert beschalteter Platine
ATV-TX-DC 6MR
dezi – gruppe – dortmund

Zeichnungs-Nr.
003

Ersatz für

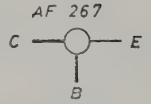
Ersetzt durch



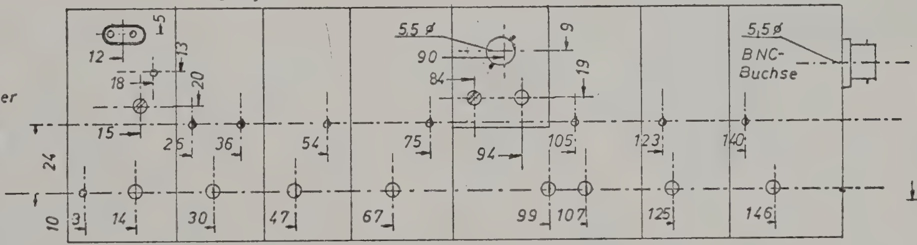
o= Keram. Durchführung „C" ø 3,5

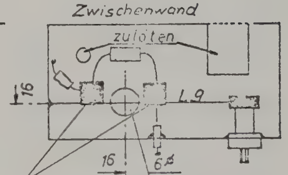
⊘= Spulenkörper ø 5,2

O=Spindel-Trimmer ø 5,5



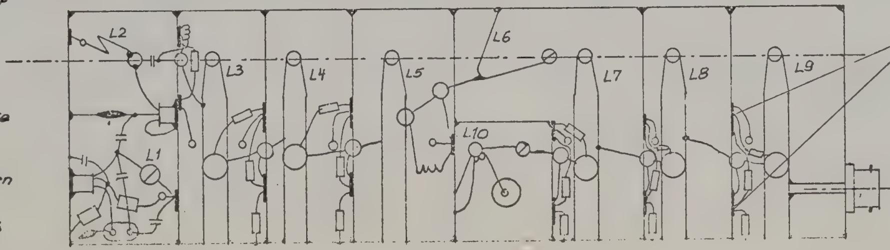
T1, T2 = BF 173
T3-T6 = AF 267/279
T7-T9 = AF 367/379
L1 8,5 Wdg. 0,9 CuL
auf 5ø Spulenkörper
L2 1½ 0,9 ø 7mm
L3-L9 34 mm lang
6 mm breit
Q 63,400 für
1296-1298 MHz
Q 61,175 für
1252~1254 MHz
Dr. 15 Wdg auf 4ø
0,1 CuL
Gehäuse Teko
Modell 374



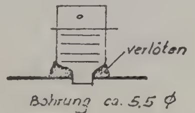


820 pF Plattenkondensator

24 cm/28MHz Konverter

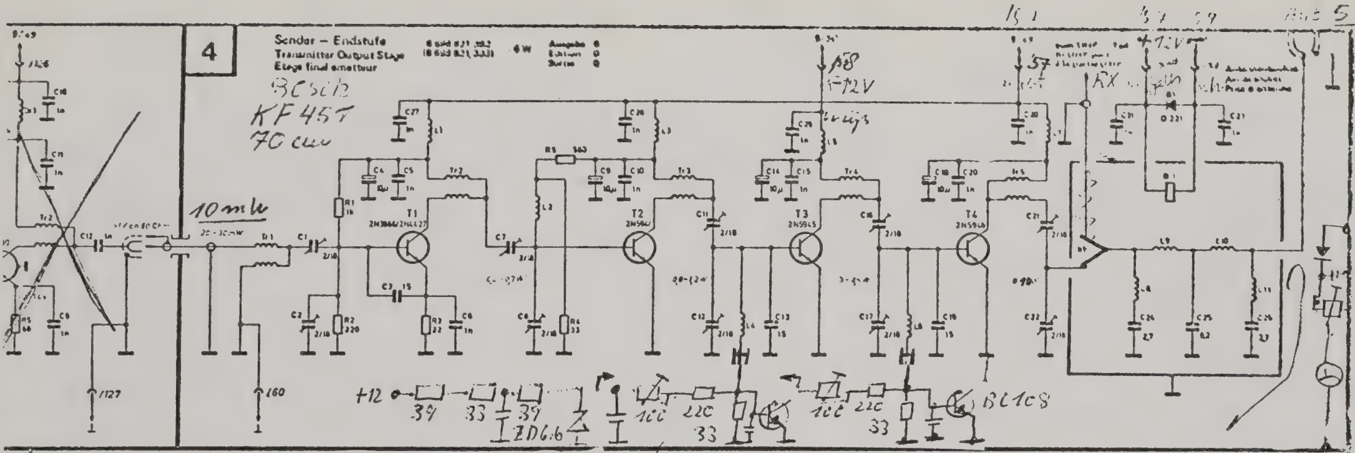


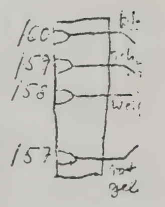
Einbau BNC Buchse



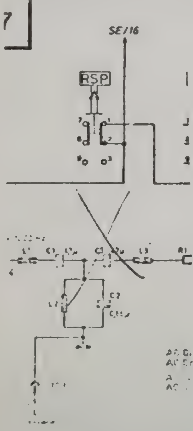
dezi gruppe dortm.
1973 DC 6 MR
gez. DK 3 AK
14.10.1975
M.: 1:1

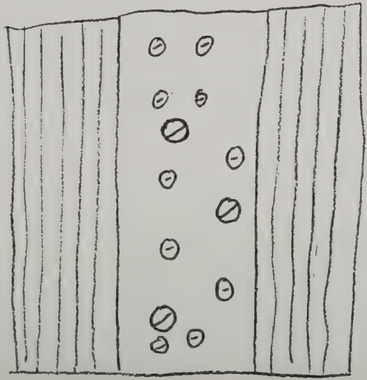
5W ATV

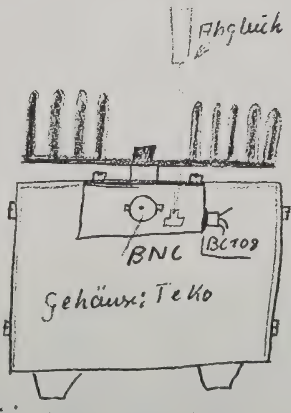




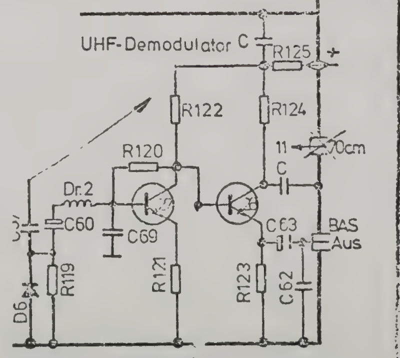
OUTPUT Meter
57/58 an +12V
59/60 an Masse







Einbau der PA



gez. 20.9.73 DC8VJ
Rev. 1 18.3.74 Rev. 2.22.6.74 15

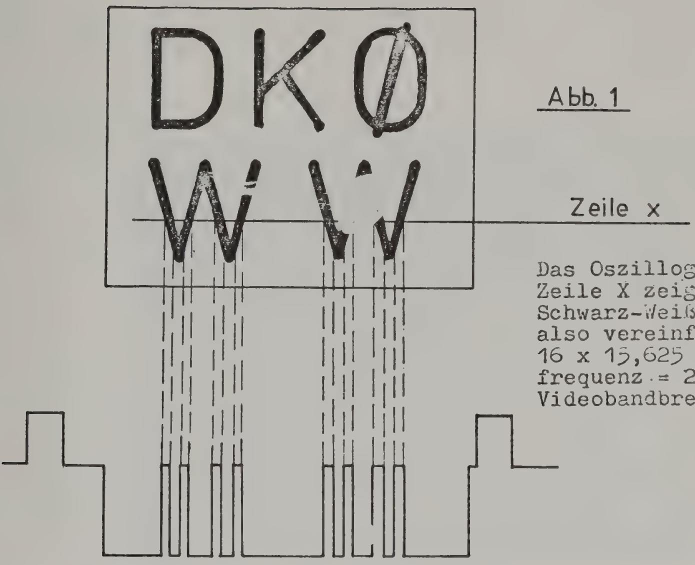
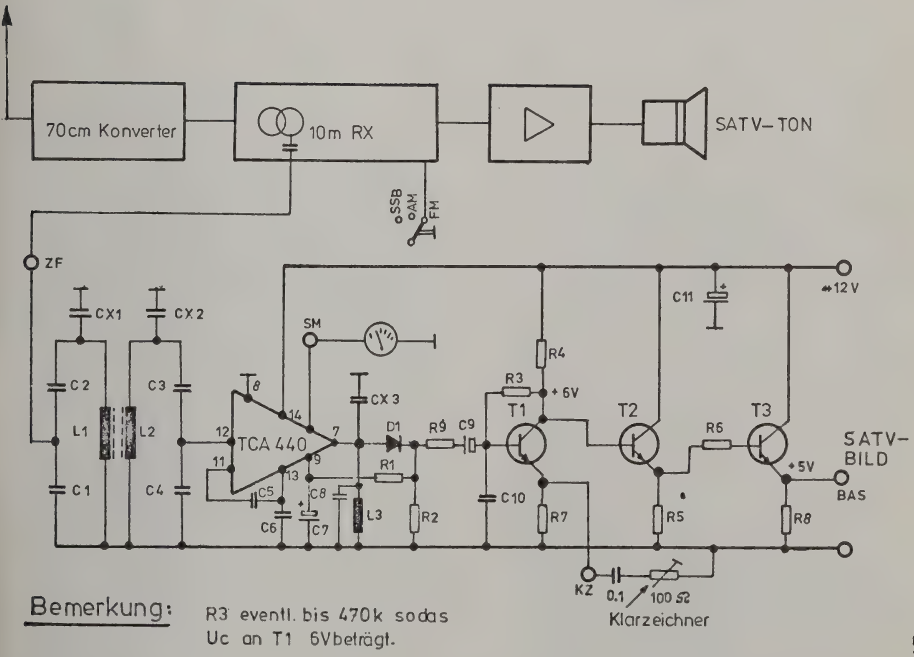


Abb. 1

Das Oszillogramm der Zeile X zeigt nur 16 Schwarz-Weiß-Sprünge, also vereinfacht 16 x 15,625 KHz Zeilenfrequenz = 250 KHz Videobandbreite.

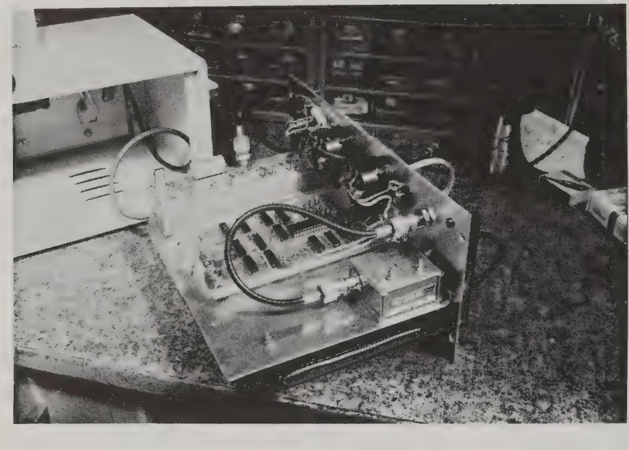
Abb. 2



Bemerkung: R3 eventl. bis 470k sodas Uc an T1 6V beträgt.

5.11.74 DC8VJ

The excellent craftmanship of the author is easilly seen in these photos of his SATV station and his antenna array. How about that snazzy deck and safety railing on the tower!



COMBINED CROSSHATCH & DOT GENERATOR.

By Alan R. Watson

The unit to be described was developed as part of a complete system for the testing and setting up of monitors etc.

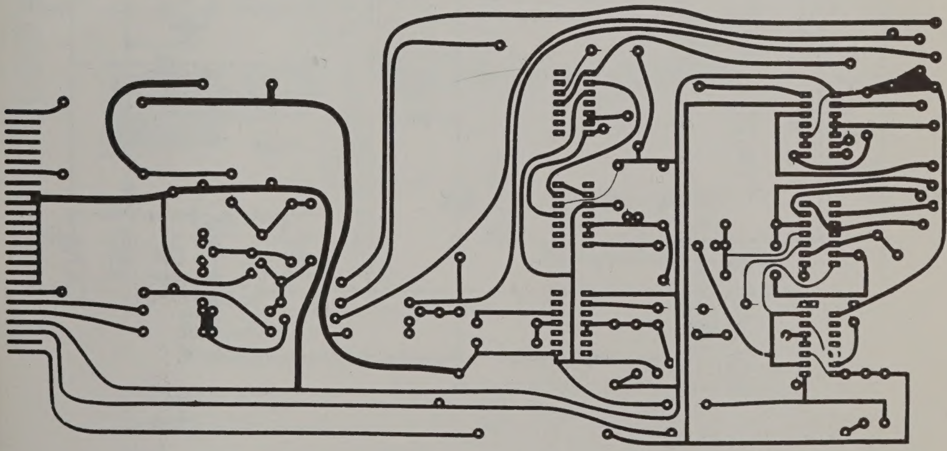
Still being developed are the colour bar generator and coder - ultimately for use in a complete camera channel. When sorted out and tested, these two will be published.

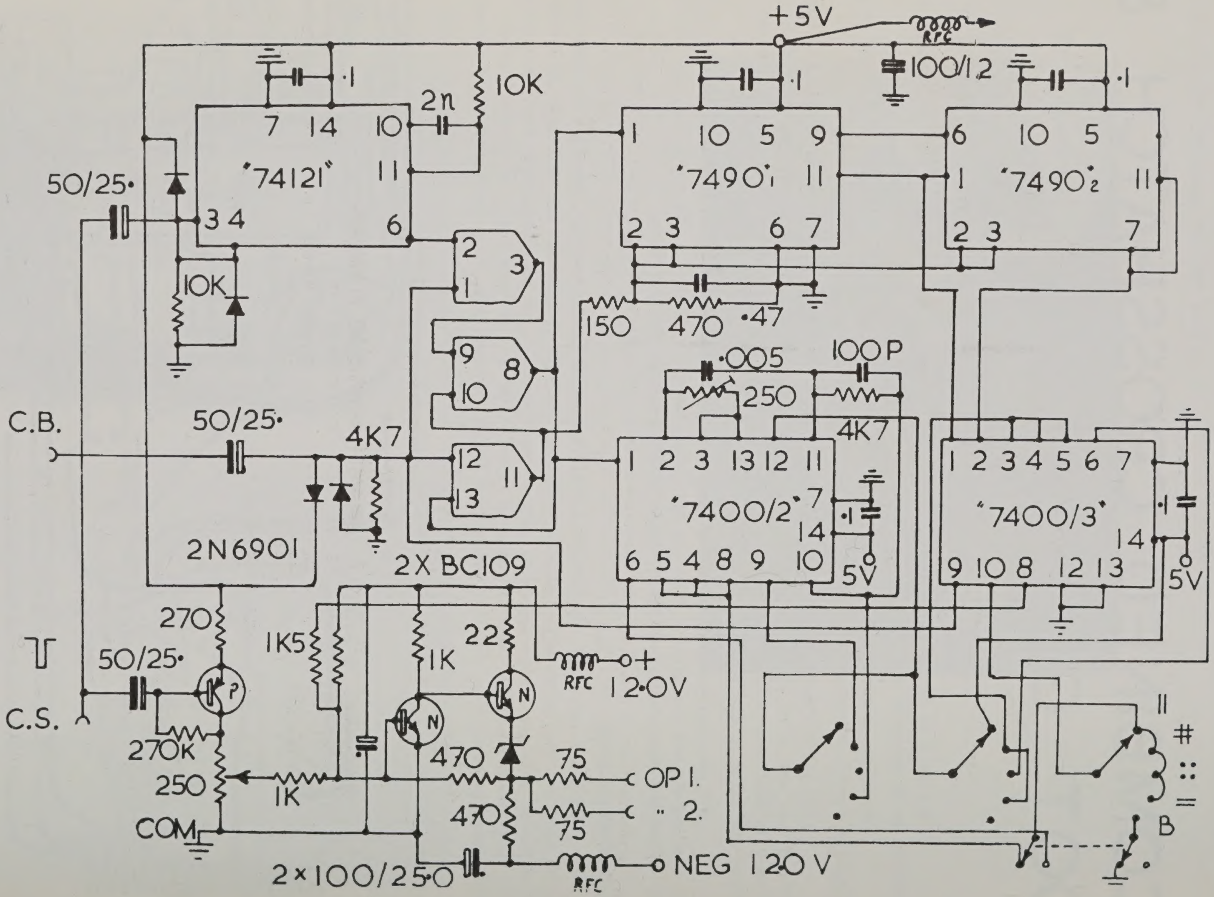
The pattern generator is driven by combined syncs and blanking from an interlaced 625 line S.P.G. and gives at its output a broadcast quality signal, with sync amplitude variable from 0 to well over 30%, comprising horizontal and vertical bars, cross-hatch, dots, black on white and white on black. A blank raster and a peak white raster are also available.

All services are controlled by just three controls on the front panel. Two isolated 75 ohm outputs are available. The unit operates from +12 volts d.c., -12 volts d.c. and +5 volts d.c. from the main stabilised power supply which feeds the whole system.

Circuit Description

Combined syncs are fed through a 74121 monostable multivibrator, giving a broader line pulse out, and then gated with combined blanking in 7400/1 to miss out the half line on alternate fields enabling a rock steady pattern to be obtained. The negative output is taken through two 7490 decade counters; each of these is reset at the end of each field, to give a locked horizontal pattern, with positive syncs from 7400/1 integrated so as only to give field pulses.




+5V
RFC
100/1.2
·1
10K
2n
"74121"
7 14 10 11 6 3 4
50/25·
10K
"7490"1
1 10 5 9 11 2 3 6 7
"7490"2
6 10 5 1 11 2 3 7
150
470
·47
·005
250
100P
4K7
"7400/2"
1 2 3 13 12 11 7 14 6 5 4 8 9 10
5V
"7400/3"
1 2 3 4 5 6 7 14 9 10 8 12 13
5V
C.B.
50/25·
4K7
2N6901
2X BC109
270
1K5
1K
22
RFC
+ 12·0V
C.S.
50/25·
270K
250
1K
COM
470
470
75
75
OP 1.
" 2.
2×100/250
RFC
NEG 120 V
II
#
::
=
B

Negative line pulses from 7400/1 are fed to pin 1 of 7400/2, which is coupled as a multivib; this gives 19 to 25 times line frequency adjustable by a 250 ohm pot.

Blanking and gating of waveforms are done in 7400/3. Patterns are selected by means of a 5-way 3 pole wafer switch and a D.P.D.T. toggle switch.

The inverted blanked output is taken to a virtual earth adder output amplifier, where it is mixed with inverted variable amplitude syncs. The zener diode in the emitter of TR3 was chosen to set the output at earth potential; thus no coupling capacitors are required. This d.c. coupling ensures no l.f. tilt on the output.

Construction

In the original unit the whole circuit was made up on a printed board, with a piece of aluminium bolted to it on spacers to enable the complete assembly to be slid into an I.S.E.P. frame. The p.c. board layout is shown for members who may wish to make their own. No links are shown on this photograph for the sake of clarity - but it should be obvious from a study of the circuit where these should go.

Should sufficient members be interested it may be possible to produce a p.c.b. Please contact the author (whose address is printed on page 1 of this issue) if you are. Such a board would not unfortunately by roller tinned.

Sid Emmons K8ZES provided the Intercity Radio club of Mansfield Ohio with a one hour program on ATV. On Nov. 5th, the 50 or so members in attendence were treated to live signals from Tom WB 8CQW as well as the personal DX photos of Sid's ATV efforts.

$$e_{ski} = \sqrt{2}\, E_{akr} \cos \left[r\omega t + \alpha_{akr} - (s-1)\, K\frac{2\pi}{m}\right]$$

Do you apply this formula as a winter-sport analgesic? No, it's a means for resolving the symmetrical components of an unsymmetrical set of sinusoidal polyphase alternating voltages, and the order of the harmonic (thirs subscript) may be anything from 1 to ∞ . The reason of including this is to plug the desire to have some of you who are technically inclined to send in some material. A5 is your magazine, and the hundreds of other subscribers would like to hear from YOU! SEND IN YOUR ARTICLES AND NEWS NOW!

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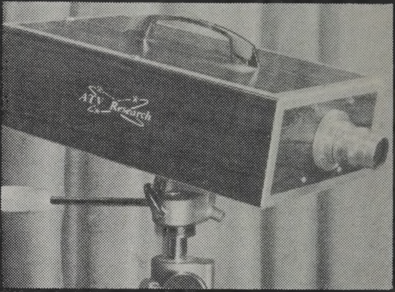

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